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SCIENCE NEWS LETTER

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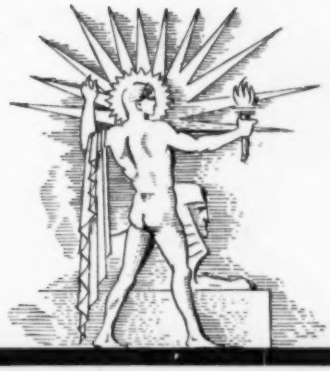
THE WEEKLY SUMMARY OF CURRENT SCIENCE •



May 25, 1940

Parent and Child

See Page 332

A SCIENCE SERVICE PUBLICATION

Do You Know?

An eighty-foot *blue whale* would weigh eighty tons, the equivalent of twenty male African elephants or of more than a thousand men.

Franklin Institute, Philadelphia, has a *portrait* studio where visitors may take this difficult type of picture with their own cameras, aided by a guide.

Maryland fur trappers report a new type of *muskrat*: the underfur is glossy and silky with rippled, wavy effects, and all guard hairs of the pelt are missing.

The scientific reason why *paper* sometimes curls annoyingly: it is due to differential expansion of the two sides of a sheet when atmospheric conditions change.

Calling West Virginia the country's most *duckless* state, a forestry professor blames lack of lakes and swamps for the ducks' tendency to keep flying when over this region.

Turkey has doubled farm acreage in the past ten years, and is in the favorable position of being self-sufficient in essential farm products except for coffee, tea, and rubber.

A "cloverleaf" *house* for four families is a novel design evolved by the U. S. Housing Authority, as having advantages over row houses.

For normal growth, a pig's *diet* requires at least five different vitamins and probably two more, says a University of California agriculturist.

Sloping a *lawn*, even slightly, away from the house will help keep the cellar dry.

Entomologists have faint hope of finding a cure-all *spray* for insect pests, but progress is made in controlling a number of pests with one treatment.

The British Navy is adding vitamin C to its *cocoa* rations, as a nutrition experiment.

The technique of slantwise *drilling* has enabled oil men to drill as many as eight wells from the same surface location.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

AERONAUTICS

How may the occupation of Iceland aid in delivery of American-made planes to the British? p. 326.

What is the war doing to the air power of belligerents? p. 327.

ASTRONOMY

How does the fall of Holland affect an astronomical observatory in Michigan? p. 325.

Why are the accepted astronomical distances likely to change materially? p. 324.

BIOLOGY

What sort of creature wears both scales and hair? p. 331.

What sort of organism has been found to manufacture food substances without the aid of chlorophyll or light? p. 333.

BOTANY

What sort of food can you find in the wild? p. 329.

CHEMISTRY

Where are made-in-America chemical products on display? p. 328.

CHEMISTRY—MILITARY SCIENCE

What gas might be used to paralyze soldiers in a closed space? p. 324.

GENETICS

How were marigolds half a foot in diameter produced? p. 332.

GEOGRAPHY—METEOROLOGY

In what part of the Americas can rubber be grown? p. 331.

GEOGRAPHY—MILITARY SCIENCE

What lessons for Alaska defense can be learned from Finland? p. 333.

LANGUAGE

How are French war names pronounced? p. 328.

MEDICINE

What new role has been found for vitamin B_1? p. 329.

Why is skin reddening not always a good index to X-ray dosage? p. 329.

MEDICINE—BIOLOGY

How can electric shock bring an electrocuted person back to life? p. 330.

What disease is carried by vampire bats? p. 330.

METEOROLOGY

What New England catastrophe had its origin in West Africa? p. 328.

NUTRITION—ECONOMICS

What kind of candy is a by-product of cheese? p. 328.

PHYSICS

Why is infra-red light of little value for seeing through fog? p. 329.

Why are the foundations of physical science subject to change? p. 323.

PHYSIOLOGY—PSYCHOLOGY

What happens in your brain when your eye sees a bright light? p. 325.

PLANT PHYSIOLOGY

What effect does the gas from moldy lemons have? p. 328.

POPULATION

Why is Brazil a good laboratory for study of population problems? p. 329.

PSYCHOLOGY

What is likely to be the psychological effect of the dropping of parachute troops? p. 323.

SCIENCE NEWS LETTER

Vol. 37 MAY 25, 1940 *No. 21*

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PHYSICS

Nature Not Game of Chance Prof. Einstein Contends

Says He Is Unwilling to Abandon Idea of Direct Representation of Physical Reality in Space and Time

PROF. Albert Einstein, famous for his revolutionary theory of relativity, affirmed his disbelief that "events in nature are analogous to a game of chance," despite the success of the quantum theory of physics that substitutes for all previous theories of the physical world the idea that it is not possible definitely to place events in time and space.

Speaking before the Eighth American Scientific Congress in Washington, Prof. Einstein admitted that science does not have any general theoretical basis for physics which can be regarded as its logical foundation. His attempt and the attempts of others, upon which years have been spent, to develop a field theory formulation that would embrace both the immense universe and the world within the atom, have failed.

"It is agreed on all hands that the only principle which could serve as the basis of quantum theory would be one that constituted a translation of the field theory into the scheme of quantum statistics," Prof. Einstein said. "Whether this will actually come about in a satisfactory manner, nobody can venture to say."

Science has greater security in its experimental contacts than in its logical foundations, he indicated.

"The word foundations," he explained, "in this connection does not mean something analogue in all respects to the foundations of a building. Logically considered, of course, the various single laws of physics rest upon this foundation.

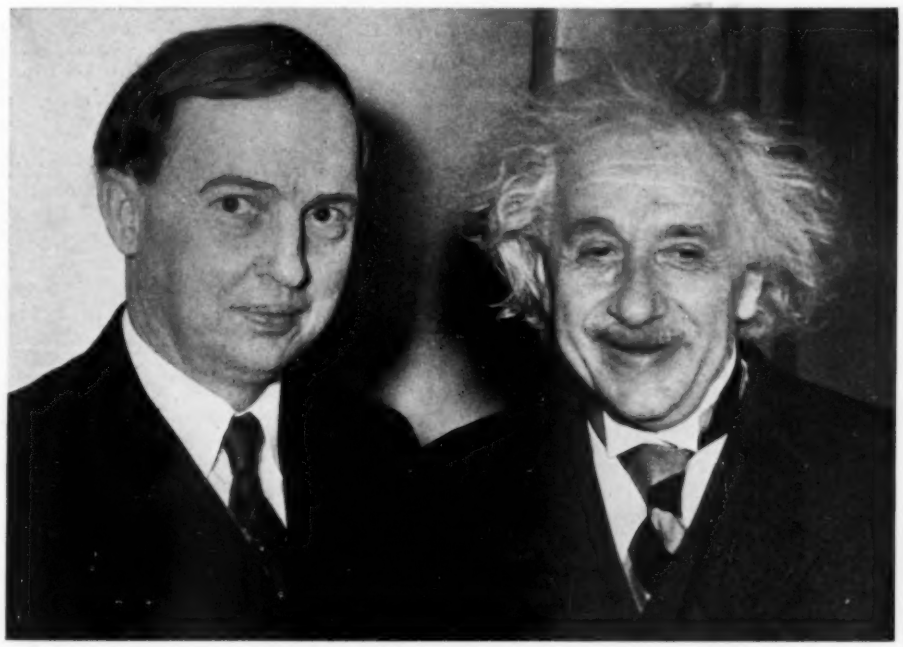
"But whereas a building may be seriously damaged by a heavy storm or a spring flood, yet its foundations remain intact, in science the logical foundation is always in greater peril from new experiences or new knowledge than are the branch disciplines with their closer experimental contacts. In the connection of the foundation with all the single parts lie its great significance, but likewise its greatest danger in the face of any new factor. When we realize this, we are led to wonder why the so-called revolutionary epochs of the science of physics have not more often and more completely changed the foundation than has actually been the case."

The ability to predict just where something will be at some definite future time was called in question by the evolution of theoretical physics to which Prof. Einstein contributed so largely. Prof. Werner Heisenberg, German physicist, has convincingly shown, Prof. Einstein admitted, that "any deterministic structure of the nature is definitely ruled out, because of the atomistic structure of our experimental apparatus."

Yet Prof. Einstein is unwilling to believe that "we must abandon, actually and forever, the idea of direct representation of physical reality in space and time."

He promised to continue to strive for more knowledge which will allow science to predict the future as pre-Einsteinian theories of the physical world seemed to make possible.

Science News Letter, May 25, 1940



AT THE SCIENTIFIC CONGRESS

The Eighth American Scientific Congress heard special addresses by Professor Albert Einstein (right), of the Institute of Advanced Study, Princeton, and Dr. Harlow Shapley, director of Harvard Observatory and vice-president of Science Service.

PSYCHOLOGY

Parachute Troops May Be Psychological Weapon

PARACHUTE troops, if they are being dropped in disguise by the Germans behind their enemies' lines, may prove of much more value in the psychological "war of nerves" than for any possible direct military advantage.

If a single Nazi fighter, dropped suddenly in Dutch uniform or civilian clothes on the Dutch countryside, can arouse suspicions among the Dutch—can make them look with fear on every stranger and distrust their own defenders—the single parachute soldier can do more harm than can tons of propaganda leaflets, or hours of radio haranguing.

Psychologists who have studied the ef-

● Blighting Shadow

From the address of Secretary of State Cordell Hull on the first plenary session of the Eighth American Scientific Congress at the Pan American Union, May 13.

"We deeply deplore the fact that a blighting shadow of cultural eclipse has temporarily fallen on so many countries in other parts of the world. We are supremely fortunate that in this Hemisphere thought is still free, and science is still untrammeled. It is for us to see to it that they remain so—for our own sakes and for the sake of all humanity."

fects of propaganda on the minds of warring peoples have learned that actions speak much louder than words.

No whispering campaign could possibly have the power for setting up dissension, suspicion and fear that is stirred by the conviction that even one or two of the enemy have dropped from the sky in unknown locations.

If the Germans are able to divert even a small part of the energies of the British, French, Dutch and Belgians into a campaign of hate against the foreign-born or "suspicious characters" and make Dutch shoot Dutch, French shoot French, and English shoot English, then the parachute troops provide Hitler with an extremely potent new weapon in his war of nerves.

Science News Letter, May 25, 1940

ASTRONOMY

New Methods Will Change Accepted Distances in Space

Improvements in the Yardstick of the Universe May Change Estimates as Much as Thirty Per Cent

ASTRONOMY is improving its yardstick of the universe in order to make it a more accurate measure of vast astronomical distances The improvement may alter some accepted astronomical measurements by as much as 30%.

This was the news reported to the Eighth American Scientific Congress by Dr. Harlow Shapley, director of Harvard College Observatory, the man who first succeeded in providing astronomy with this valuable measuring technique.

Essentially the method depends on the so-called "period-luminosity relationship" of Cepheid variable stars, a certain type of star which fluctuates in brightness and derives its name from the constellation in which this type was first found.

The relationship, first found during a study of the Small Magellanic Cloud, by Miss Henrietta Leavitt of the Harvard Observatory in 1912, is simple—the period in which a Cepheid variable dims and brightens is related directly to its intrinsic brightness. Dr. Shapley later found this was true of all Cepheid variables. Thus by studying the period of such a star, astronomers can learn its absolute brightness and by comparing this with its apparent brightness, they can measure its distance. The yardstick has been of tremendous value for once an astronomer has found a Cepheid variable in a far-off galaxy, he can learn its distance and thus that of the entire galaxy.

There are various factors which affect the apparent brightness of a star as observed from this earth, however, which, if not allowed for, render measurements inaccurate. Dr. Shapley has just finished a survey of some 300 Cepheid variables in the Small Magellanic Cloud to learn what these factors are and how to allow for them. One of the important factors, he found, is that the light of a star is absorbed as it travels through this cloud to earth and thus may appear as much as half a magnitude less bright than it actually is. This was the first study of absorption ever made in an outside universe, although astronomers have made many studies of absorption in our own Milky Way. On an average, Dr. Shapley found, a star's light loses about a quarter of a magnitude in the cloud, but, of course, each star must be measured individually.

The thickness of a galaxy also affects a star's light (depending on whether it is on the near or far side) and a phenomenon known as "doubling," resulting from two stars in the same line of sight, also affects these observations.

Dr. Shapley estimated that because of this absorption and remaining uncertainties in the period-luminosity relation for the longest period Cepheids, the distances of some galaxies may be incorrect by as much as 30%. Relative distances will not be altered appreciably, however; nor do these studies require any major change in the accepted distances of the Magellanic clouds.

Dr. Shapley also called attention to the need for more study of the relations between period and luminosity for Cepheids of very short or very long periods, as well as the need for more dependable magnitude standards in the southern sky where many important studies of external galaxies are being made. Today's accepted magnitude standards have been established in the northern sky and comparisons of these southern stars involve the risk of a certain amount of error.

Dr. Shapley's discussion of this topic was most appropriate for the American Scientific Congress for the plates from which they were made were taken by Harvard in Peru. He also showed exceptionally fine photographs of a solar eclipse taken in Peru in 1936.

Science News Letter, May 25, 1940

CHEMISTRY—MILITARY SCIENCE

"Sleeping Gas" (If Used) May Be Methyl Bromide

THE "sleeping gas" used by the Germans in capturing a fortress in Belgium—if they used such a gas—may very well be methyl bromide, a heavy liquid that produces anesthesia, paralysis and even death if it can be distributed in air in sufficient concentration.

This is the suggestion of Dr. Theodore Koppanyi, professor of pharmacology at Georgetown Medical School. Methyl bromide is a material available in millions of pounds quantities in any industrial country since it is widely used in chemical manufacture.

Distributed in a closed fortress or air raid shelter by a shell explosion or some other means, it is believed that a concentration of the chemical could be built up in the air that would be effective in putting soldiers to sleep. If enough were introduced it might kill them.

Instead of the methyl bromide, the Germans may be using some related compounds, such as acetyl bromide, propyl bromide, or other higher esters. All are heavy liquids.

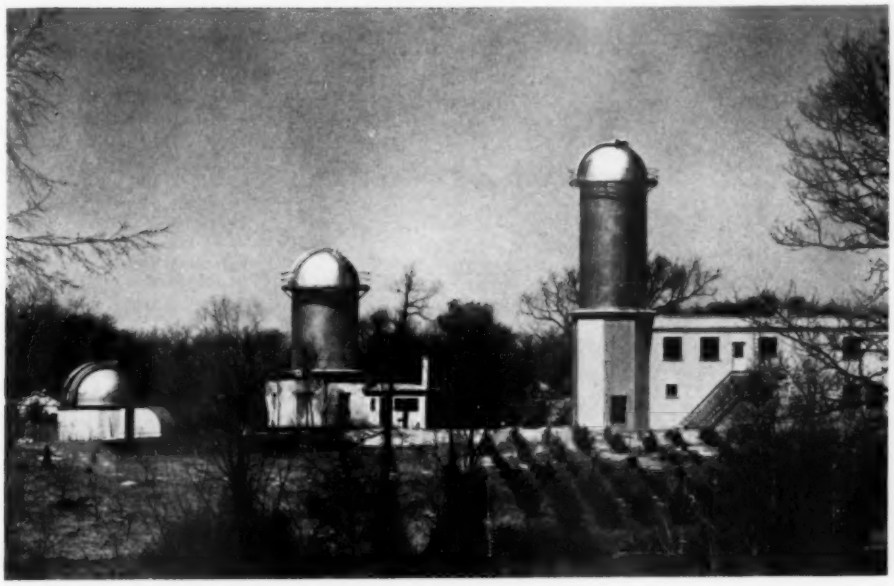
The anesthetic properties of the bromides have been known since about the 1880s. Once they were used in medical anesthetic mixtures, but they have been largely replaced by better and more efficient chemicals in operating rooms.

The idea that acetylcholine could be used as the Germans are supposed to have used the sleeping gas is declared to be impossible. This chemical found in the human body is not only a relatively rare one but it is a crystalline solid. Scientists do not see how it could be put into a fortress or used otherwise effectively even if it were available.

Science News Letter, May 25, 1940

Among the fruits which Comanche Indians dried in the sun and stored were *persimmons,* wild grapes, wild plums, and fruit of the prickly pear cactus.

Cod-liver oil for medicinal purposes must be rendered from fresh cod livers immediately after the fish are caught, whereas technical grades can be produced with less trouble and more cheaply.



TOWER TELESCOPE

In these buildings of the McMath-Hulbert Observatory, will be housed the new tower telescope which, it is hoped will add greatly to scientific knowledge of the sun.

ASTRONOMY

Netherlands Invasion May Halt Completion of New Telescope

German-Made Glass Disks for Some of Optical Parts Held by British Contraband Control; Fate Not Known

THE NAZI invasion of the Netherlands may delay indefinitely completion of the new tower telescope of the McMath-Hulbert Observatory, to be dedicated on May 25, as part of the University of Michigan. German-made glass disks for some of the optical parts, though ordered before the outbreak of war, have been delayed in Amsterdam, awaiting release by the British Contraband Control. Their present fate is not known, though it is hoped that they may have been released before Amsterdam fell.

The new telescope, and a laboratory building from which it rises in a 70-foot tower, are the gift of the McGregor fund to the University of Michigan. Their dedication will bring new recognition to Dr. Robert R. McMath, who takes time from his business of making automobile equipment to take movies of the sun.

Dr. McMath founded the Observatory in 1929, with the aid of his father, the late Francis C. McMath, and Henry S. Hulbert, former Detroit probate judge, who is now president of the McGregor fund. In 1931 the founders deeded the Observatory to the University of Michigan, but Dr. McMath has continued in charge.

Important new facts about the sun have been discovered by the McMath-Hulbert Observatory researchers. Most of these studies are with motion pictures taken through a special type of telescope. Those in the past have been made with a tower 50 feet high, at the top of which are two mirrors to reflect the sun's light down into the telescope itself. Under the tower is a pit containing a spectroscope, analyzing the sunlight into the colors of which it is composed. The movies are made in the light of a single element of the sun's atmosphere. Ordinarily we see the sun by the light of all the elements combined.

Rising high above the new building is the new 70-foot tower, which will supplement, but not replace, the work of the older tower.

Many thousands of feet of film have been exposed on the sun during the last few years, during which it has been in great activity. These show, very spectacularly, great flame-like masses of hydrogen and calcium shooting out from the sun to vast heights, a million miles or more. But the careful study of these films, picture by picture, has revealed that the stuff shot out makes sudden and inexplicable changes in velocity. It will travel for a hundred thousand miles or so at one speed, then immediately start moving at a much faster rate.

Another puzzling phenomenon is the way these glowing gases sometimes appear high above the sun's surface, seemingly materializing out of nowhere. For hours there will be a continual supply, as if from some invisible hose. In other cases gases are shot up, and then fall down again. From the researches now being made, it is hoped these effects will be explained.

Science News Letter, May 25, 1940

PHYSIOLOGY—PSYCHOLOGY

Lights Flashing in the Eye Produce Waves in the Brain

WHEN your eye sees the flash of a bright headlight streaking past you, a burst of electric waves is set off in a part of your brain. This electrical display in the brain was described by Dr. Samuel A. Talbot, of the Wilmer Institute Laboratory of Physiological Optics, before the Washington-Baltimore Branch of the American Psychological Association.

The waves are not those known as "brain waves" which are generated in the brain cells themselves. The brain waves — "alpha rhythms" as they are called by scientists — were completely damped out in Dr. Talbot's experiment by use of an anesthetic. The anesthetic also stopped all the electrical activity of the "association" or thinking area of the brain.

But when Dr. Talbot flashed exploring lights into the eyes of his experimental cats and monkeys from different parts of the animal's field of vision, he was able to tap the electric signals as they appeared in the brain. So sharply localized were the "message centers" that received the signals, that Dr. Talbot was able to map the part of the brain that governs vision just by electroplating with a minute spot of iron the exact position where the electrode picked up the electric impulses as the lights were flashed from a corresponding point in the visual field.

Psychologists have observed that when you have looked at a bright flash of light

you will continue to "see" it for a little while after it is turned off. During this time it will pulsate rapidly. For this reason, a band of light passed across your field of vision may appear to you like a series of bright stripes. A single flash of light may appear as a sort of vibration.

This rapid fluctuation in vision has its parallel, Dr. Talbot found, in a volley of multiple electric waves at the point in the brain concerned with perceiving the light.

Science News Letter, May 25, 1940

AERONAUTICS

Bombers for Allies Could Be Delivered Under Own Power

All of Five Bomber Types Under Construction Capable of Making Flight by Short Northern Route

MASS transatlantic flight deliveries of American bombers now on order for the Allies are envisioned as blitzkrieg and counter-blitzkrieg in Europe begin eating rapidly into aircraft reserves.

All of the five bomber types now under construction for the Allies, particularly if extra gasoline supplies are loaded, are capable of making the North America-to-Europe flight by the short northern route. The planes could be flown to Foynes, Eire, or directly to England from Botwood, Newfoundland, in summer use since last year as a seaplane base for Pan American Airways and Imperial Airways flying boats. A large landplane field is part of the Botwood base.

Any doubt as to the possibility of such deliveries should now be dispelled as a result of the occupation of Iceland by British forces. The Allies are now in a position to use Iceland as a refueling point for any bombers of whose ocean-spanning ability there is any doubt. The nature of facilities at Reykjavik was not immediately known, but however bad they may be they could be quickly enough improved.

The five bomber types on order include: $9,000,000 worth of Consolidated 28-5 flying boats, similar to the U. S. Navy's famous PBY patrol bombers. Delivery of these is expected to start this summer. They would be flown to Europe in any event. A 28-5 purchased by England a year ago for test purposes was flight delivered last summer.

France has already taken delivery on most of 100 Douglas DB-7 attack bombers. Extreme range of these 310-mile-an-hour medium bombers can be built up to 2200 or 2300 miles by loading gas in place of military equipment and the normal 1,250-pound bomb load.

The same is true of the 390-mile-an-hour Douglas B-20 attack bombers, of which several hundred are being built for the Allies and the U. S. Army Air corps. An additional order for at least 1,000, to be built by Consolidated and Boeing under license, has just been placed.

Globe-girdler Howard Hughes flew a Lockheed 14 non-stop to Paris, 3,300 miles, in the summer of 1938 on the first leg of his epoch-making round-the-world-flight. It is therefore expected that the 500 Lockheed Hudson bombers already delivered to Great Britain could have made the journey. A further order for 250 Lockheed bombers, based on an improved Lockheed plane, is currently under negotiation. These can also be flight delivered by filling up the cabin with gasoline tins.

No large four-motored craft have been ordered yet by the Allies, so far as is known. None are expected to be purchased, as many military experts hold that they are not suited to conditions in Europe.

The U. S. Army Air Corps has in service about 350 bombers capable of flight across the Atlantic. These include about 225 Douglas B-18 as derived from the world-famous Douglas DC-3 passenger liner, and about 100 four-motored "Flying Fortresses," 20-ton Boeing B-17 bombardment craft.

The Navy has more than 250 twin-motored patrol bombers, mostly fourteen-and-a-half-ton Consolidated flying boats.

Many of the 215 (at least) 320-mile-an-hour Martin 167W attack bombers ordered by France have also already been delivered, but the rest could similarly be rushed across the Atlantic by air.

None of the high-speed bombers, of course, would be flown at more than a fraction of their top or even normal cruising speeds, in order to cut down fuel consumption and make the ocean flights possible. A probable transatlantic flight speed for the two Douglas and one Martin models is about 200 miles an hour. A few four-motored Consolidated and Sikorsky ships are also on hand or on order.

A squadron of twin-engined Martin patrol bombers, which can also easily make the hop, were delivered to the Navy during the last year but considerable trouble has been had with them and they were returned to the factory at least for a time.

The weather is now almost ideal for flight deliveries.

Biggest problem the Allies will face in high-speed-under-their-own-power shipment of the anti-Nazi airplanes will be that of securing pilots with adequate experience. American pilots may be hired as "ferry men"—many have already been hired as instructors for the Empire air training program, now getting underway in Canada. These have not had to give up their citizenship as they take no oath of allegiance to Britain. Their work violates no American laws.

American-born pilots are also serving in the Royal Air Force and the Royal Canadian Air Force. These, of course, have given up their citizenship as they had to swear allegiance to the King.

In what way Americans ferrying war craft to Britain would be penalized, American laws are not exactly clear. The neutrality act prohibits Americans from working or traveling on belligerent ships and aircraft or foreign vessels entering the belligerent zone as defined by proclamation of President Roosevelt. Competent American pilots could be found in the ranks of the Army Air Corps.

In an emergency, instructors in the Empire training program could also be put to work on ferrying aircraft across the ocean. But the pilot problem, it was emphasized, is the biggest difficulty to be solved before large scale flight deliveries become possible.

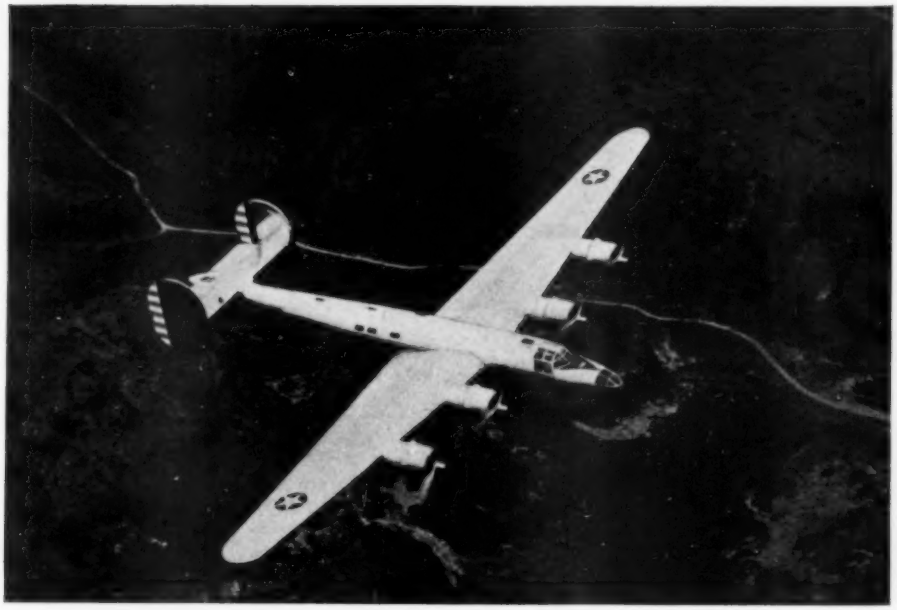
Title to the planes would, of course, have to be transferred to the Allies before the planes leave the U. S. by Allied pilots as has been the case since the start of the war.

Science News Letter, May 25, 1940

Gold mining is an expanding venture in the Fiji Islands.

Sea ice loses a good deal of its *salt* as it ages—the salt migrates from the interior.

The world's longest *floating bridge*, under construction across Lake Washington near Seattle, will be a mile and a quarter pontoon span.



XB-24

A new Consolidated land bomber poses for one of its first flight pictures. This four-engined ship has 4,800 horsepower in flight with a gross weight of about 40,000 pounds and 110 feet of wing spread. It carries a crew of from 6 to 9 persons.

AERONAUTICS

Air War on Present Scale Will Reduce Air Power

Planes and Pilots Are Being Destroyed at Rate Far Greater Than They Can Be Produced and Trained

CONTINUANCE of air fighting on the scale of the first few days of the German invasion of the Low Countries will cut the size of the contending air forces within a few months to the point of reducing World War II use and effectiveness of air power, aviation men predicted.

About 100 Nazi warplanes were shot down in the first day of real action. Though reliable reports of losses since then have not been received, it is probable that a ship mortality rate nearly as high is being maintained. At least 150 pilots were put out of action with the end of those 100 ships. This is higher than the maximum daily rate of plane and engine production in Germany, believed to be about 2500 planes a month or eighty to eighty-five a day, and is certainly far higher than the rate at which pilots can be turned out. It takes only a few days to produce a fighter plane and a few weeks for a bomber. But even the brutally stepped-up German pilot training program cannot train pilots in less than five months.

British losses are yet unknown, but the daily aircraft production rate in the United Kingdom is certainly less than forty-five. If the losses are not so high it does not mean that the R.A.F. is superior to the German Luftwaffe (it is not) but that full use is not being made of the English craft. The British government may be keeping them in reserve for attacks on England from the bases Germany will obtain if she wins out in Belgium.

Air war today, in other words, is about to run full tilt into the mechanical limitation of how fast planes can be built and the human limitation of how fast pilots can be taught to fly. This has not happened before.

Because of the longer time involved in training a pilot, the pilot supply is likely to be the more serious limitation. In the case of Germany, gasoline is also a likely brake on Blitzkrieg.

The Allies today have not more than 15,000 pilots ready for action. If 50 Allied planes a day are shot down, that means that 75 pilots are no more, which adds up to more than 2200 a month. This is certainly more than are now being graduated. The Empire air training program will not turn out that many flying men of all kinds (gunners and observers as well as pilots), let alone pilots, when it is fully under way, which it will not be for close on to another year. It is also extremely unlikely that Germany is graduating 75 pilots a day.

The rates of decline of the different air forces, of course, are the differences between losses and production. The German Luftwaffe's strength is currently between 11,000 and 20,000 planes. Even at Germany's high production rates, the loss of 100 ships a day will make itself felt in a few months, though not so quickly as the loss of pilots. Allied ship casualties at a similar rate would cut the Anglo-French air arms in half in a short time. Allied strength is now eight to eleven thousand for the R.A.F. and 3,500-6,000 for the French; many units, however, are in the Near East or the colonies.

Present casualty rates may be higher than experts figured before Sept. 3, 1939. The U. S. Army Air Corps fixed plane losses at 25% a month, the English at 30% a month and Germans and Italians at 50% to 80%. These percentages are figured against total air forces. A 100% figure simply means replacement of an entire air force once a month, obviously impossible for today's swollen air arms. German difficulty in keeping up air strength when losses are 100 a day means difficulty in keeping her air force up when the monthly casualty rate is about 30%.

Pilot and plane production headaches will thus soon put a powerful brake to the extravagant employment of air power. Air forces will be stabilized at a level which is a compromise between casualty rates and production figures. This level is certain to be far below present strengths—each side may have at most a few thousand aircraft on active service.

It will be noticed that there has been omitted consideration of the effect of bombardment of aircraft factories on this analysis. The reason why is the impossibility of predicting how seriously air bombing of factories will affect production rates. We know only that it will cut them down. Aerial destruction of factories will thus lower still further the level at which air forces can be maintained, but how much cannot now be told.

LANGUAGE

Aid in Pronouncing Names; Easier To Say Than Spell

BELGIAN and French scenes of fighting and bombing in Europe's vast battle recall the World War, when Americans endeavored to pronounce Rheims and Liege in European fashion. Here are a few names in the conflict, accented more or less evenly, with stress on last syllable.

Belgian: Liege (lee-ahzh); Tongres (tohn-gr'); Namur (nah-moor); Arlong (ahr-lon—with nasal ending); Brabant (brah-ban—with nasal ending); Louvain (loo-van—with nasal ending).

French: Orleans (or-lay-an—with nasal ending); Rheims (rahnts—with nasal ending); Vosges (vohzh); Montmedy (mohn-may-dee); Longwy (lohn-wee); Nancy (nahn-see); Sedan (say-dan—with nasal ending); Epernay (a-pair-nay).

Science News Letter, May 25, 1940

PLANT PHYSIOLOGY

Gas From Moldy Lemons Speeds Yellow Coloration

GAS of still unknown chemical composition, given off by moldy lemons, greatly speeds up the production of yellow color on the rinds of sound lemons kept in the same room or container, it has been discovered by Dr. J. B. Biale of the University of California at Los Angeles.

When dark green lemons are exposed to the vapors produced by the mold fungus they color up several weeks earlier than similar unexposed fruits and their respiratory activity is greatly accelerated. There is also a tendency to shed the stem bases or "buttons," and in some cases pitting of the rind has resulted.

Science News Letter, May 25, 1940

METEOROLOGY

West Africa Is Blamed For New England Hurricane

WEST Africa is to blame for the famous and disastrous hurricane of September 21, 1938, which will not be forgotten for many years. Study of weather maps by a French meteorologist reported by Dr. Charles F. Brooks, of Harvard's Blue Hill Meteorological Observatory, shows that a wave of low pressure in the south central Sahara desert on September 4 was joined by a northerly trade and a southwesterly monsoon as it neared the African coast at Cape Verde and also an easterly equatorial wind on the north. These three air masses interplayed to create the tropical cyclone which marched across the Atlantic and on up the American east coast to cut a swathe across New England. Probably other tropical hurricanes like the famous one also have West African origin.

Science News Letter, May 25, 1940

CHEMISTRY

America's Self-Sufficiency Shown in Chemical Display

HOW the United States is attaining national self-sufficiency by its chemical research is shown in the exhibit of E. I. du Pont de Nemours & Company which has been redesigned for the New York World's Fair.

Made-in-America materials are displayed which can replace former imports that in times of war may be difficult to obtain. Included in the display were:

Nitrates, dyes, medicinals, potash, synthetic rubber, optical glass, and camphor.

A feature of the exhibit this year will be the actual knitting of hosiery made of Nylon fiber; the synthetic material which is one of America's best answers to the Japanese domination of the natural silk trade.

Science News Letter, May 25, 1940

ENGINEERING

Heat Spreading a Test For Safe Maximum Load

A NEW way for engineers to calculate safe maximum loads at all speeds on a bearing, such as those in your automobile engine: The way in which heat spreads around the bearing, considered in connection with what is known about the friction in such bearings, can be used to make the necessary calculation, S. A. McKee of the National Bureau of Standards has discovered.

Science News Letter, May 25, 1940

ASTRONOMY

Latest Super Explosion Observed in Heavens

LATEST super explosion in the universe is a new object, star-like, not moving, located at the southern tip of the edgewise galaxy of stars, spiral NGC 5907, discovered by Dr. Josef J. Johnson of the California Institute of Technology, observing at Palomar Mountain, site of the new 200-inch telescope. The object is apparently a gigantic exploding star, a supernova.

Science News Letter, May 25, 1940

IN SCIENC

NUTRITION—ECONOMICS

Newest Kind of Candy Is By-Product of Cheese

NEWEST candy is a by-product of cheese developed by B. H. Webb and C. F. Hufnagel of the U. S. Department of Agriculture's Bureau of Dairy Industry and called "Wheyfers" because they are made from whey, waste product in cheddar or Swiss cheese manufacture. The new candy is not cooked but is dried hard and crisp. Sweet pasteurized whey and sugar are evaporated together under vacuum to a thick, smooth consistency. Then air is whipped into it until light and fluffy. Chopped nuts or cooked cereal is added and the mixture is rolled out into a thin layer and dried, cut into wafers and dipped in chocolate.

Science News Letter, May 25, 1940

ENGINEERING

Accident May Have Led To Self-Lubricating Wire

BECAUSE of a happy accident, graphite, being used as a lubricant in drawing stainless steel wire through a die was ground into the metal surface, the extremely fine colloidal graphite particles intimately combining with the metal. As a result, Acheson Colloids Corporation engineers may have found a way to make a self-lubricating wire for use where such a lubricant will prevent binding, sticking and wear. Graphite is already used as a dry lubricant, reducing the tendency to stick even when oils and greases are not used.

Science News Letter, May 25, 1940

CHEMISTRY

Pocket Indicator Made For Carbon Dioxide

LATEST use of methyl methacrylate, crystal-clear plastic that is lightweight and shatter-proof: To make a pocket carbon dioxide indicator used to check whether fuel is being wasted in the gases that go up the chimneys of power plants. The passages for the testing liquid are drilled directly into the transparent plastic. Manufacturer: F. W. Dwyer Manufacturing Company, Chicago, using du Pont "Lucite."

Science News Letter, May 25, 1940

CE FIELDS

BOTANY

Wild Foods Are Available For Your Own Dinner

THE adventure of hunting dinner in the wild, recommended in European countries, is not confined to nations eating war rations. The Washington Monument grounds in our capital this spring are dotted—as usual—with dandelions and with citizens gathering dandelion greens. Market stands feature cress, wild mustard, tender poke shoots. The British and Germans are going further, of course. A new book *Wild Foods of Britain,* by Jason Hill (Black, London) praises crab apple tea, tansy pudding and pickled ash keys (walnut flavor). Mr. Hill claims to have tried everything wild he recommends, and some wild food he doesn't. He votes thumbs down for acorn coffee.

Science News Letter, May 25, 1940

MEDICINE

Must Change Procedure In Cancer Treatment

HOSPITALS using the new high-powered 1,000,000-volt X-ray tubes in the treatment of cancer must change their procedure in using the erythema reddening of the skin as an index of dosage, Dr. G. Failla and Mrs. Edith Quimby, physicists of Memorial Hospital, New York City, told the American Physical Society.

Frequent method of collimating the 1,000,000 volt X-rays is to pass them through a lead opening whose open end is covered with a piece of bakelite. This bakelite, it has been found, creates large numbers of so-called secondary electrons which are highly effective in producing skin reddening.

Dr. Failla and Mrs. Quimby reported experiments in which they set out to demonstrate clearly the creation of these unwanted secondary electrons in the X-ray beam. To do this they radiated a patient with a beam of 1,000,000 volt X-rays which passed through nothing except air for the last 10 inches of its path before reaching the skin. They covered half the exposed area with a piece of rubber sheeting. It was found that after a given treatment the skin under the rubber sheeting was strongly reddened while the uncovered area still showed no erythema reddening.

The scientists showed that the reddening of the skin as an index of X-ray dosage in cancer treatment may be permissible for 200,000 volt X-ray tubes widely used, but that it is not a proper gage of dosage for the new 1,000,000 volt X-rays. They claim that with 1,000,000 volt X-rays there should be nothing in the X-ray beam as it comes to the patient, which will create secondary electrons.

Science News Letter, May 25, 1940

POPULATION

Brazil Great Laboratory For Study of Population

BRAZIL, South America's largest country, was suggested as a great outdoor laboratory for the study of migration problems by Dr. Roberto C. Simonsen, technical adviser of the Brazilian Institute of Geography and Statistics, speaking before the meeting of the Eighth American Scientific Congress in Washington.

Brazil has its problems of migratory labor, especially migratory farm labor, no less than the United States, although the problems are different, at least in part, Dr. Simonsen pointed out. Their magnitude is well indicated by the migration, during the past year, of 100,000 persons from other states of the interior into the southeastern state of Sao Paulo, center of more than half of the country's entire agricultural and industrial production. These migrants, like many in the United States, were driven from their lands by drought.

Brazilian farmers are much attached to their land, and will leave it only under the urge of really bad economic conditions, the speaker stated. Not even the prospect of better living conditions will lure them away from their home acres, as long as they have any chance to wrest a living from the soil. Once detached, however, they drift toward more promising fields, and after a period as landless laborers, manage as a rule to acquire small holdings of their own.

A considerable factor in promoting folk migration in Brazil has been economic stagnation attendant upon a single-cash-crop system. First sugar, now coffee, were at first bonanza crops, then economic headaches for the great southern republic. And a prominent symptom of such economic dislocations has always been a drift of agricultural migrants.

Science News Letter, May 25, 1940

PHYSICS

Infra-Red Useless in Fog And Also in Falling Snow

SUGGESTIONS that long invisible infra-red radiation could be used to pierce fog were refuted by experiments reported to the American Physical Society by J. A. Sanderson of the U. S. Naval Research Laboratory, Washington, D. C.

The naval scientist measured the infra-red absorption of clear natural fog in the infra-red region out to wave-lengths of 12 mu, or 120,000 Angstroms. The limit of ordinary vision is in the deep red near 7,500 Angstroms. Mr. Sanderson found that the transmission of the long infra-red rays was fairly uniform throughout the entire region studied which leads "to the result, in accordance with previous measurements and theory, that there is no important advantage in employing long wave-length infra-red light in seeing through fog." It was also found that falling snow scatters all wave-lengths equally so that in a snowstorm there would be no special advantage in infra-red radiations.

Science News Letter, May 25, 1940

MEDICINE

New Role For Vitamin B_1 In Protecting Blood Vessels

A NEW role for vitamin B_1, that of protecting blood vessels from damage, was discovered in experiments by Dr. Leo Alexander of Boston reported to the American Association of Pathologists and Bacteriologists at Pittsburgh.

Pigeons deprived of this vitamin developed a disease identical with the hemorrhagic brain inflammation that afflicts chronic alcoholics, Dr. Alexander reported. This disease is characterized by degeneration and deformity of the blood vessels. It can be produced in pigeons as complication of beriberi if the pigeons are getting enough of other vitamins than B_1, the beriberi preventive. If the pigeons are getting enough of this B vitamin, however, they will not get the alcoholic brain disease even if they are deprived of any one or all other vitamins for more than six months.

Vitamin B_1 is known to act as a nerve protecting substance, or a preventive of neuritis. The pigeon experiments, Dr. Alexander said, show that it also acts to prevent blood vessel degeneration and that smaller amounts of the vitamin are sufficient for this effect.

Science News Letter, May 25, 1940

MEDICINE—BIOLOGY

Electric Shocks Snap Hearts Out of Fatal Twittering

Found To Be More Valuable in Certain Cases of Fibrillation Than Drugs or Shock and Massage

ELECTRIC shocks that snap hearts out of fatal twitterings may checkmate death and shock the victim back to life, the Eighth American Scientific Congress was told. The electric shock treatment is recommended in certain cases when death comes suddenly following an anesthetic, after an electric shock, or in the heart disease known as coronary occlusion.

Dr. Carl J. Wiggers, of Western Reserve University Medical School, reported the advantages of his method of restoring the heart beat over drugs such as quinidine and procaine and over the combination of a single electric shock with massage of the heart to start it beating.

In the type of cases he investigated death comes suddenly because of a condition known medically as ventricular fibrillation. The French name for it, insanity of the heart, describes it very aptly. Ordinarily the many muscle fibers of the heart all contract together in regular rhythm to pump the blood out into the arteries. In fibrillation, the muscle fibers act as individual units. The result is a useless twittering and quivering instead of a strong contraction. When the heart gets the jitters this way, it fails to pump blood out to the rest of the body and death follows swiftly.

Strong counter-shock of electricty has been given dogs to stop the useless twittering and get the heart back to its normal rhythmic beating. To achieve the same results in a man, however, the doctor would have to use a current of from 27 to 30 amperes at 2,000 to 3,000 volts. This would be dangerous to both doctor and patient, Dr. Wiggers said.

Weaker currents can be used, and the heart's fatal twittering can be more certainly abolished, Dr. Wiggers has found from recent investigations, if a series of three or four shocks are given at intervals of about one or two seconds, instead of one strong shock.

Science News Letter, May 25, 1940

LANGUAGES Made easy By LINGUAPHONE

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Test With Dried Blood

A TEST for syphilis that can be made with a small amount of dried blood, avoiding the necessity of drawing blood from a vein, which is difficult in the case of infants and timid persons, was recommended to the Congress by Dr. A. Diaz Albertini, Dr. A. Recio and Dr. G. Lage, of Havana, Cuba.

The test was devised by Dr. Alejandro Chediak, of the Municipal Maternity Hospital of Havana. As many as 500 of these Chediak tests can be made daily, at a total cost per test of about three-fourths of a cent, according to experience quoted by the Cuban physicians of 210,000 such tests made in 21 months by Dr. P. D. Dahr, of the Institute of Hygiene of Cologne, Germany.

Science News Letter, May 25, 1940

Uses For Cultures

USES of both "practical" and "pure" scientific value have been found for plant roots and other tissue cultures, grown detached from the original parent stock and kept going for long periods in nutrient fluids. Dr. Philip R. White of the Rockefeller Institute for Medical Research at Princeton, N. J., told the Congress about some of these new uses.

One, of considerable immediate importance is the employment of excised roots as living culture media for mosaic diseases of plants. One such study has already shown that the disease virus tends to concentrate in the middle part of the root fragment, away from both tip and basal ends. It has also shown that age rather than amount of root tissue apparently determines the degree of activity of the virus.

In his own experiments, Dr. White reported, he has learned some valuable facts about the nutritional requirements of roots, especially about their use of mineral salts and vitamins. Thiamin, one member of the vitamin B complex, is necessary for root growth, but in exceedingly minute quantities. A solution containing one part of thiamin in a million million will suffice.

Science News Letter, May 25, 1940

Vampire Bats Convicted

VAMPIRE bats have been convicted as carriers of a dangerous form of rabies causing paralysis in livestock, in researches reported by two Venezuelan scientists, Drs. Juan Iturbe and P. Gallo, before the Eighth American Scientific Congress in Washington.

The affected animals usually lose the use of their hind legs; only in two or three per cent of the cases are the front legs paralyzed also. The causal virus is able to pass through the pores of porcelain filters, and shows a considerable degree of resistance to heat. Heating at 95 degrees Centigrade (nearly boiling) for two minutes does not kill it.

Blood-drinking bats carry the virus from animal to animal, but do not themselves develop symptoms of the malady. Such bats fight a good deal among themselves, and Drs. Iturbe and Gallo have found that infection can be spread from bat to bat in this way. Whether naturally or experimentally infected, bats can carry the virus for a long time in their bodies. Since they are capable of living actively for several days without food, it is possible for the flying animals to carry the disease for long jumps into previously rabies-free territory.

Drs. Iturbe and Gallo have succeeded in preparing a preventive vaccine, which has shown encouraging results in the use which has thus far been made of it. They are now at work on a vaccine prepared by another method, from which they hope for even better results.

Science News Letter, May 25, 1940

Snails Tell History

SNAILS that live on Cuba's mountaintops tell of several times in past ages when Cuba was not the single island with a mountainous backbone that we know today, but a chain of smaller is-

AQUEDUCT

This new aqueduct, the world's longest, is a 993-mile job, to carry spring water from the Apennines to 3,000,000 people who live along the heel of the Italian boot. Double pipelines of the main artery, shown above, are almost six feet across and can take a flow of 222 cubic feet per second. The network of the Puglia Aqueduct, as it is called, is expected to promote development of five of Italy's provinces which have been handicapped by water shortages and by such maladies as typhoid.

lands with channels between the present peaks. How these beautiful and variegated land shells have served as geologic historians was related by Dr. Carlos de la Torre of the University of Havana and Dr. Paul Bartsch of the U. S. National Museum.

Cuba is the home of what is perhaps the largest snail family in the world, comprising 355 species and 702 subspecies, Dr. de la Torre explained. Yet there is no doubt that all these originally evolved from a single ancestral form. As the island alternately rose and subsided, the limestone areas that are the homes of these snails were alternately united and separated. During the periods of separation, since inter-breeding was impossible, the many distinct forms of today came into existence.

Science News Letter, May 25, 1940

Both Scales and Hair

A SOUTH AMERICAN animal that is a "non-missing link" between mammals and their reptilian ancestors was described to the meeting by Dr. Glover M. Allen of Harvard University. It is a primitive member of the rodent group, known as the paca.

In several orders of mammals, scales are present on tails and backs of feet, Dr. Allen said. This is true of rodents, marsupials and ant-eaters. However, in the paca the scales are found on the body as well, with the hairs coming out between them. Dr. Allen described this arrangement as "probably present in early mammals."

Science News Letter, May 25, 1940

GEOGRAPHY—METEOROLOGY

Advocates Rubber Cultivation In the American Tropics

Growth of Rubber in Its Native Warm Lands of the New World Would Be Good for Land and for People

RETURN of rubber production to its native home, the tropical lowlands of the Americas, was advocated before the Eighth American Scientific Congress by Loren G. Polhamus of the U. S. Department of Agriculture. Not only would the development of rubber growing in the warm lands of the New World render this hemisphere more nearly independent industrially of the remote and war-threatened East Indies, but it would be good for the land itself and the people who live thereon, the speaker declared.

Regions suitable for the cultivation of rubber have heavy rainfall, which endangers the land through erosion if the forests are cleared away and large-scale field crops introduced. To protect the soil, and at the same time to get something commercially valuable out of it, the best things to cultivate are tree crops.

Rubber cultivation does not necessarily have to be conducted on huge holdings by the factory-like methods of the great East Indian plantations, Mr. Polhamus pointed out:

"Many factors favor production of rubber by small holders who are able to take advantage of the use of intercrops which do not interfere with the growth of the rubber tree but which may help to produce a subsistence for the grower. Large expenditures for equipment are not necessary and the small holder need not have the labor difficulties faced by large corporations. The labor of his own family can be used before noon for tapping rubber and after noon for production of food crops."

The Hevea rubber tree now grown almost exclusively on Dutch and British plantations in the East Indies is a native of tropical America, so that there is no question of its adaptability to New World conditions. It is exposed to plant diseases here, but resistant varieties have been originated and further improvements, both in disease resistance and latex yield, are now being worked on by plant breeders.

The Hevea rubber tree need not be the sole dependence of American planters, either, Mr. Polhamus continued. There is another species, the Castilla rubber tree, that thrives better in the drier, cooler uplands, and it might prove to be the foundation of a rubber-growing industry for the Central American plateau country.

Science News Letter, May 25, 1940

Water Important in Peru

A LAND where conservation means just one thing—water conservation—was described in an address by Harold Conkling, deputy state engineer of California. The land is coastal Peru, where there is no rain to erode soil, no forests to preserve, no range problem. The one

Why Smash Atoms?

By ARTHUR K. SOLOMON

ATOM-SMASHING is today one of the most important activities of scientists. Dr. Solomon here explains the work of one type of atom-smasher, the cyclotron, and describes the transforming effects of atom-smashing on the sciences of physics and chemistry, as well as in medicine. He makes clear to the layman the nature, purpose, and results thus far of these epoch-making advances. Fully illustrated.

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big job is to find water where there is arable land, and then get the water on the land.

Ironically, the four largest rivers that cross Peru's narrow coastal plain must forever waste their water into the ocean, for there is no land worth irrigating near them. Also, it is impracticable to build storage reservoirs in the mountains, because the Andes rise too suddenly and steeply.

Reservoirs are natural ones, consisting of great masses of loose soil and gravel in the valleys, which get filled up with water, sponge-fashion, every year. The water is brought up by pumping from wells between 50 and 200 feet deep. A promising new project, fostered by the Peruvian government, has in view the diversion of flood waters, now almost entirely wasted.

Science News Letter, May 25, 1940

Sunspots Affect Weather

HEAVY sunspot outbreaks are followed by rain in southeastern Brazil, Dr. J. de Sampaio Ferraz, formerly director of the Brazilian Meteorological Service, told fellow-scientists at the Scientific Congress. A close statistical study of records covering 60 years of observations indicated that when sunspots are exceptionally large and numerous, the tropical interior of the country is heated up more than usual, and this is followed by rain-bearing storms migrating down to the warm-temperate state of Sao Paulo, where the observations were made.

This situation in Brazil is quite similar to that obtaining for North America, as studied for many years by Dr. Charles G. Abbot, secretary of the Smithsonian Institution. On this continent, Dr. Abbot has stated, heating effects over the interior plains are followed by storms migrating in an easterly direction.

Dr. Ferraz also found increases in rainfall without any preceding increase in sunspot activity. However, it appears that at times the output of solar energy increases steeply without any sunspot manifestations. The spots, after all, are symptoms, not causes of increased solar activity.

Science News Letter, May 25, 1940

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GENETICS

Colchicine Treatment Produces Striking New Flower Varieties

See Front Cover

MARIGOLDS half a foot across, snapdragons with blossoms of deeper color and sturdier stems, spearmint of a different flavor are among the newest accomplishments in plant breeding made possible by colchicine. These and other plants have been developed at the New York State Agricultural Experiment Station (Geneva) by a husband-and-wife team of scientists, Drs. Bernhard R. Nebel and Mabel Ruttle Nebel.

The marigolds are perhaps the most spectacular, for their sheer size and brightness of yellow and orange colors. Original breeding stock was the familiar African marigold species. Young seedlings of this species, after treatment with colchicine solution grew up and produced offspring with double the usual number of heredity-bearing chromosomes. Technically such plants are known as tetraploids. Results have varied somewhat from variety to variety.

Another line of marigold breeding has been the production of a fertile strain out of the hitherto sterile hybrid between African and French dwarf marigolds, by doubling its chromosome number. This plant also bears flowers larger than those of either the untreated hybrid or the French Dwarf parent.

The new African tetraploid has also been crossed with French dwarf varieties, with results of horticultural promise.

Ten new tetraploid snapdragon varieties have been obtained. These show considerable variability in form, size, and fertility, depending on the variety from which they were derived. The flowers are larger than those of the parent and deeper in color; the corollas are more wavy; the plants are sturdier and more erect; the leaves are a deeper green.

The new tetraploid spearmint was produced by treating the underground shoots or runners of commercial spearmint plants with colchicine. Ordinary spearmint is a hybrid of unknown ancestry, and is sterile. The new tetraploid is fertile and has an odor unlike that of its parent.

Partly tetraploid apple stem tissue has been produced by treating buds with colchicine. If further growth produces entirely tetraploid shoots, new varieties and important material for further breeding work will be at hand.

Discovery of the great value of colchicine in plant breeding work was no lucky accident, the Nebels emphasize. It developed in the manner that can be considered normal for any major scientific advance: the step-by-step accumulation of knowledge about the properties and effects of the material in hand, contributed to by many workers, and the final application to a new problem when the time was ripe.

In the case of colchicine, the effects of

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the drug in checking cell division at one particular point in its progress had been studied and reported on by a number of men, working mostly on animal cancers. Possibilities in turning this behavior to account in artificially producing cells with increased chromosome counts (and hence new genetic properties) suggested themselves to certain French investigators and simultaneously to the Nebels and to Dr. A. F. Blakeslee of the Carnegie Institution of Washington. They did their work independently, and published results almost simultaneously in the journals.

Now all plant breeders are using colchicine. Some of them have produced plants which promise to be of considerable economic value.

The illustration on the cover of this number of THE SCIENCE NEWS LETTER is from a photograph of one of the Nebels' colchicine-produced marigold varieties. The improved tetraploid flower is contrasted with one from a plant of the original parent variety, shown at lower right.

Science News Letter, May 25, 1940

BIOLOGY

Food Made Without Sun And Without Chlorophyll

One-Celled Water Organism, Chilomonas Paramecium, Can Also Grow and Reproduce on Only Inorganic Salts

MAKING food substances (starch and fat) without chlorophyll and in the dark, rated as a biological impossibility by all accepted standards, is a regular performance of a one-celled water organism known scientifically as *Chilomonas paramecium*. Not only that, but Chilomonas can make food, grow and reproduce in a solution containing only inorganic materials, Prof. S. O. Mast of the Johns Hopkins University told fellow biologists at the meeting of the Eighth American Scientific Congress.

In Prof. Mast's experiments, single individuals of this microscopic aquatic species were isolated and kept in bacteria-free drops of water in hollowed microscope slides. Rate of growth was determined by the rapidity of reproduction by division. Starch grains and oil droplets could be seen through the transparent body substance of the tiny creatures.

Chilomonas can form food in light as well as in darkness, Prof. Mast reported, but he found that starch accumulated in its body more rapidly when it did its work in the dark. It can use organic substances if they are present, but it can get along perfectly well with only inorganic salts and carbon dioxide.

Increasing the amount of carbon dioxide in the atmosphere in contact with their tiny watery world enables the organisms to produce more food, and up to a certain point also to divide more rapidly. At the highest carbon dioxide concentrations reproduction stopped. Non-reproducing Chilomonas individuals, however, were found to be more heavily stocked with starch than the others.

Chilomonas belongs to the primitive group of organisms known as flagellates, which occupy a position near the bottom of the evolutionary ladder. Botanists and zoologists have sometimes disputed whether they are really plants or animals. They have been known to science for a long time, for they are extremely common. But until now the ability of this animal-like species to do a plant's work and make food out of inorganic substances—and without the supposedly necessary tool, chlorophyll, at that—has never been suspected.

Science News Letter, May 25, 1940

GEOGRAPHY—MILITARY SCIENCE

Alaskan Defense Can Be Learned from Finland

AMERICA can learn vivid lessons in Alaskan and Canadian defense from Arctic battling in the present European war, in the opinion of Dr. Vilhjalmar Stefansson, noted Arctic explorer, in Washington to consult with government officials on Arctic problems.

As a scientist concerned with geographic and climatic problems of the Far North, Dr. Stefansson said that a huge area of the world's surface is country where warfare—if and when it comes—must be on the Arctic and sub-Arctic plan. And as the course of military power is steadily moving northward, and has been for several thousand years, he points out, understanding Arctic conditions becomes increasingly vital.

"A vast area where wars will be winter wars exists in Alaska, Canada, northern Europe and Siberia," said Dr. Stefansson. "This coincides roughly with the area where the subsoil is continually frozen. Where the land is flat or rolling, incredible numbers of lakes form in such conditions, interspersed with thick forests.

"In summer, mechanized units cannot make progress in such country. But in winter, the rivers, such as Alaska's Yukon and Canada's Mackenzie, become broad ice boulevards into the heart of the country. And the innumerable lakes frozen over and linked by stream channels can be traversed by troops moving from one to another, guided by maps or by airplanes."

If well defended, all such countries can hold off invaders by the type of fighting the Finns did from the forests, lying in ambush for the invading army, exposed to attack on the expanses of the ice. If, however, invasion is not opposed, the lakes and rivers of Far Northern areas provide opportunity for amazingly rapid advance of mechanized troops, Dr. Stefansson points out.

Greenland, he explained, is an exception, in which this type of fighting would not work. The fringe of land surrounding the enormous central ice cap

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of Greenland is mostly mountainous, except in Pearyland in the north, and Greenland has few areas with the type of flat lake-dotted terrain of Finland and large areas of Alaska and Canada.

"Greenland's whole center ice cap provides excellent emergency landing fields for airplanes," Dr. Stefansson states. "This region used to be mistakenly rated a danger zone. Actually, it is a zone of safety."

Science News Letter, May 18, 1940

GEOGRAPHY

Fate Of 60,000,000 Natives Hangs On Belgian And Dutch

Belgium's Foreign Domain Is Concentrated in Africa But Holland's Lies in West as Well as in East Indies

FATE of nearly 60,000,000 natives in Belgian and Dutch colonies hangs in the balance as a result of German invasion of the two mother countries.

With Belgium and Netherlands caught up in Europe's total war, "protection" of large and important holdings in Africa, East Indies and America creates a new international problem. Queen Wilhelmina's domain includes islands and South American mainland only a few hundred miles from the Panama Canal.

Concentrated in Africa, Belgium's foreign domain consists of the Belgian Congo, a million square miles of equatorial territory rich in copper, rubber, cotton, cocoa, palm oil, and gold. Eighty-five times the size of Belgium itself, this vast possession is surrounded by holdings of Portugal, France, and Britain. Its coast is a mere 25-mile strip along the Atlantic.

Besides this valuable Congo colony, Belgium is responsible also for an adjoining corner of Tanganyika, a portion of Germany's former colonies assigned to Belgian mandate after the World War. Britain, which ceded this area to Belgium in return for World War assistance, has exchanged economic advantages there with the Belgians and would be most concerned over any change in its status.

More scattered but totaling an almost equally impressive area, the Netherlands colonies are all in the tropics; and, with the one important exception of Dutch Guiana in South America, the Dutch colonies are islands. Small Holland in Europe controls some 50,000,000 Javanese, Balinese, Sumatrans, and other natives of the East Indies.

The Netherlands holds a large part of New Guinea, one of the world's largest islands, and one which the Dutch have until recently been content to hold without intensive exploitation. Fear of Japan's encroachment on the East Indies is seen as the reason for Dutch activity to plant rubber, coffee, and kapok in New Guinea and to demonstrate a concern for using, as well as holding, the land.

In the shadow of the Monroe Doctrine, and short flying distance from the Panama Canal, lie the Dutch West Indies consisting of several islands off Venezuela, also the mainland colony of Dutch Guiana, in South America.

Holland's colonies figure in world trade in such valuable lines as tin, rubber, oil, quinine, spices, indigo, sugar, coffee, and tea.

Science News Letter, May 25, 1940

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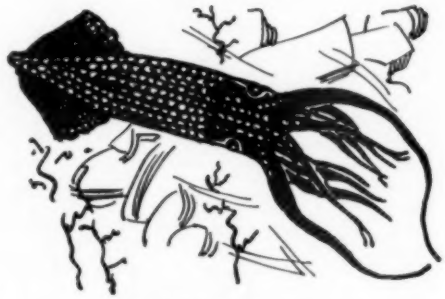
BIOLOGY

NATURE RAMBLINGS by Frank Thone



Living Lanterns

OCEANIC abysses and other unsunned parts of the world are not wholly without light. In these dark places there are numerous creatures that carry their own lanterns, and have eyes sufficiently sensitive to see by this dim light of their own providing. These carriers of cold light are described in a new book by Prof. E. Newton Harvey.

Not only in the ocean's depths but also in our own upper world of air and earth are there nocturnal creatures that light their own dark ways. Almost every large class of animals, and two great groups of plants, have representatives in the shining ranks reviewed by the Princeton biologist. Bacteria, fungi, protozoa, jellyfish, up to insects, squid and fish, all are represented.

Some, like the bacteria, have no way of turning their light on or off, and so shine with a constant glow, but most of them either flash at more or less determinable intervals (like the familiar fireflies) or burst into a glow when disturbed, like the one-celled animals that swarm in the sea during periods when the water "burns" at night.

There are certain forms without "power-plants" of their own that make use of the light-producing powers of smaller creatures, notably bacteria. One remarkable case which Prof. Harvey describes is that of two related genera of tropical fish. Below each eye, in these fishes, is a light organ apparently specially designed for growing masses of luminous bacteria. This organ has a rich blood supply, opaque screens to protect other tissues of the fish from the light, and a mechanism for turning the light on and off.

Not always, however, is the presence of luminous bacteria beneficial to the ani-

mal in which they live. There are a number of species of insects and smaller crustacea that become populated with these shining germs, and in most instances such infection is fatal. Luminous wounds in human beings have even been recorded, in days before modern aseptic surgery.

Less serious in its consequences, and with even a humorous touch, was a case of "borrowed fire" which Prof. Harvey himself observed in Cuba. He found what appeared at first to be a luminescent frog. Upon closer examination, however, it turned out that the frog had just made a hearty meal of fireflies, which were still shining so strongly that their light came through the skin on his bulging abdomen.

Science News Letter, May 25, 1940

GENERAL SCIENCE—RESOURCES

Americas Should Take Lead In Assuring World Peace

Waste or Destruction of Necessary Resources Anywhere Affects Welfare and Security of Peoples Everywhere

NATIONS of the Americas can and should take the lead in assuring world peace through equitable distribution and planned conservation of natural resources, Gifford Pinchot declared before the Eighth American Scientific Congress in Washington.

To this end, he urged the appointment of a commission to assemble data from already existing sources and put them into form that will be useful and effective when the now warring powers sit down around the council table to arrange terms of peace. This is the contribution that neutral nations can make for a lasting international concord, he pointed out, adding, "It would be wise to prepare in time."

Mr. Pinchot said, in part:

"The proposal is that the nations of the Americas prepare now for an endeavor to bring all nations together, at the right moment, in a common effort for conserving the natural resources of the earth, and for assuring to each nation access to the raw materials it needs, without recourse to war.

"In all countries some natural resources are being depleted or destroyed. Needless waste or destruction of necessary resources anywhere threatens or will threaten, sooner or later, the welfare and security of peoples everywhere. Conservation is clearly a world necessity, not only for enduring prosperity, but also for permanent peace.

"No nation is self-sufficient in essential raw materials. The welfare of every nation depends on access to natural resources which it lacks. Fair access to natural resources from other nations is therefore an indispensable condition of permanent peace. . . .

"The conservation of natural resources and fair access to needed raw materials are steps toward the common good to which all nations must in principle agree. Since the American nations are less dependent on imported natural resources than European nations, and since they are already engaged in broadening international trade through negotiated agreements, their initiative to such ends would be natural and appropriate.

"The problem of permanent peace includes, of course, great factors which the foregoing proposal does not cover. But it does cover that factor which is certainly, in the long run, the most potent of them all."

Science News Letter, May 25, 1940

● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association of the following preliminary epicenters:

Saturday, May 4, 2:24.1 a.m., EST

Near Attu Island (Aleutians). Latitude, 53 degrees north. Longitude, 173 degrees east. Strong shock.

Saturday, May 4, 4:01.4 p.m., EST

May have occurred in Persia, near Caspian.

Saturday, May 4, 9:03.6 p.m., EST

Apparently near the coast of northern Peru.

Saturday, May 11, 8:54.6 a.m., EST

Near Attu Island (Aleutians). Latitude, 52.7 degrees north. Longitude, 172.4 degrees east. Moderate shock.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see SNL, Feb. 24.

Adjusting traffic *lights* so that they are bright in the day and dimmer at night is being tried in England for blackout reasons, but they may also be plainer that way when drivers face the sun.

BIOLOGY

Students Take Subjects But Do Subjects "Take"?

STUDENTS often talk of "taking" a subject, but often the subject doesn't "take" on the student. A single exposure seems to confer lifelong immunity. At any rate, they don't do anything with or about it afterwards. Perhaps the textbook for the course is partly responsible. It rounds up the course, finishes it, makes no provision for later continuation. A new text, *Everyday Biology,* by Curtis, Caldwell and Sherman (Ginn) does something to remedy this defect. Its final section provides "leads" that may make biology a lifelong interest — hobby, if nothing more serious — by suggesting how to "go collecting" (and how to make needed equipment), how to do nature photography, how to identify animal tracks, how to "bring 'em back alive" and keep 'em alive at home, how to make gardens, or models of gardens and a score of other fascinating activities. If you "take" biology this way, very likely you'll never get over it.

Science News Letter, May 25, 1940

Britons call the *flaps* on barrage balloons "ton patches" because from them mooring cables hang, and each weak-looking flap is tested for taking a ton of weight.

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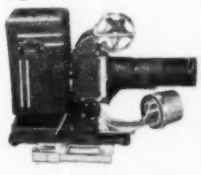

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•First Glances at New Books

HYGIENE

PICTURE OF HEALTH—James Clarke—*Macmillan,* 125 p., 60 c. Here is one of the clearest and most interesting books about the human body that has come across this reviewer's desk in a long, long time. Without resorting to jazzy style or sugar-coating, the author presents the facts about how the body is built and how it works, and lets these facts tell their own exciting story. That the book reads like an exciting story is tribute to the author's skill in writing clearly and simply about subjects the layman generally considers complicated and mysterious.

Science News Letter, May 25, 1940

MEDICINE

TWELVE AGAINST ALCOHOL — Herbert Ludwig Nossen—*Harrison-Hilton,* 246 p., $2.50. Twelve patients under treatment for alcoholism tell their life histories, particularly experiences leading to alcoholism.

Science News Letter, May 25, 1940

CHILD STUDY

TEACH YOURSELF CHILD CARE—Harry S. Reynolds—*Fortuny's,* 154 p., $1. The information in this book is given in the form of questions asked by mothers and the answers of the doctor.

Science News Letter, May 25, 1940

MEDICINE

CONGENITAL MALFORMATIONS — Douglas P. Murphy — *University of Penn. Press,* 98 p., $2. This volume, for medical scientists, reports a "study of parental characteristics with special reference to the reproductive process."

Science News Letter, May 25, 1940

LIBRARY SCIENCE

BOOKLIST BOOKS, 1939—*American Library Assn.,* 59 p., 75c.; 10 or more, 65c. each. The A. L. A.'s valuable annual selection of books, chosen by proved usefulness in libraries.

Science News Letter, May 25, 1940

REFERENCE—TECHNOLOGY

DICTIONARY OF TECHNICAL TERMS (3rd. ed.)—Frederic S. Crispin—*Bruce (Milwaukee),* 324 p., $2.25.

Science News Letter, May 25, 1940

POLITICAL SCIENCE

SCIENCE AND POLITICS IN THE ANCIENT WORLD—Benjamin Farrington—*Oxford Univ. Press,* 243 p., $2.50. A study of obstacles to the spread of scientific outlook in Greece and Rome. Political expediency hampered and thwarted the spirit of early scientific inquiry, this British scholar shows. Seeing democracies now at the cross-roads, he predicts: "Either we must base our civilization more thoroughly on scientific foundations, or we must destroy science itself."

Science News Letter, May 25, 1940

ARCHAEOLOGY

THE PREHISTORY OF UGANDA PROTECTORATE — T. P. O'Brien — *Cambridge (Macmillan),* 318 p., $7.50. Discarding climate changes as a basis for dating East African prehistoric culture, the writer finds geology a sounder guide to classifying deposits. The outstanding conclusion which he emphasizes as emerging during his study of the region is that African Stone Age Man achieved his own, essentially African culture: archaeologists cannot expect to solve African archaeology by European comparisons.

Science News Letter, May 25, 1940

SOCIOLOGY—PSYCHOLOGY

MODERN MARRIAGE—Moses Jung, ed. —*Crofts,* 420 p., $3.75. Twenty authorities join in a frank and complete discussion of the major aspects of marriage with emphasis on the ethical and aesthetic implications of the marriage relationship. The book is an outgrowth of the modern marriage course offered for the past six years at the State University of Iowa.

Science News Letter, May 25, 1940

BIOLOGY

EVERYDAY BIOLOGY—Francis D. Curtis, Otis W. Caldwell and Nina Henry Sherman—*Ginn,* 698 p., $1.92. An unusually well thought out general biology text for high schools, with illustrations calculated to make the ideas stick. (See page 335.)

Science News Letter, May 25, 1940

CHEMISTRY

RUBBER LATEX—Henry P. Stevens and W. H. Stevens—*Chemical Pub. Co.,* 223 p., $2. This monograph gives the best collection of facts on rubber latex which are probably to be found in any book.

Science News Letter, May 25, 1940

CHEMISTRY

GENERAL COLLEGE CHEMISTRY—Leon B. Richardson and Andrew J. Scarlett—*Holt,* 683 p., $3.75. The first course in chemistry as taught at Dartmouth College. This book constitutes the second-revision (third writing) of Richardson's general chemistry.

Science News Letter, May 25, 1940

AERONAUTICS

FLIGHT WITHOUT POWER, The Art of Gliding and Soaring — Lewin B. Barringer—*Pitman,* 251 p., $3.50. Six outstanding glider authorities have contributed to this excellent book on glider flying. Aerodynamics, types of gliders, design and construction, methods of launching gliders, instruments, flight training and soaring technique illustrate the scope of the book.

Science News Letter, May 25, 1940

CRIMINOLOGY

INTELLIGENCE AND CRIME, A Study of Penitentiary and Reformatory Offenders —Simon H. Tulchin—*University of Chicago Press,* 166 p., $2. Criminals, like the rest of us, are most likely to have average intelligence. But among those guilty of fraud, a smaller percentage have inferior minds than among those guilty of murder or sex crimes.

Science News Letter, May 25, 1940

ECONOMICS

MODERN ECONOMIC PROBLEMS—Albert L. Meyers—*Prentice-Hall,* 311 p., $2.50. The preface to this textbook reminds one of the radio announcements accompanying, these days, political speeches and news commentaries from Europe. "All expressions of opinion," declares the author, "are my own and in no way reflect the official attitude of the United States Department of Agriculture."

Science News Letter, May 25, 1940

CHEMISTRY

THE CHEMISTS' YEAR BOOK, 1940—Founded by F. W. Atack; edited by E. Hope—*Chemical Pub. Co.,* 1257 p., $6. This new edition of the British chemical handbook has a content equivalent to the American Handbook of Chemistry and Physics. It is handy in size.

Science News Letter, May 25, 1940

PSYCHOLOGY

A STUDY OF JEALOUSY AS DIFFERENTIATED FROM ENVY—T. M. Ankles—*Bruce Humphries,* 109 p., $2. An American edition of an English work written from the psychiatric viewpoint. The author, who sees jealousy as an infantile reaction to an adult situation, offers a method for eradicating this destroyer of human peace and happiness.

Science News Letter, May 25, 1940

BIOLOGY

LIVING LIGHT—E. Newton Harvey—*Princeton Univ. Press,* 344 p., $4. (See page 334.)

Science News Letter, May 25, 1940